

< Back to results | 1 of 1

Export Download Print E-mail Save to PDF Add to List More... >

Full Text View at Publisher

Physical Review Letters  
Volume 121, Issue 24, 14 December 2018, Article number 242301

Observation of Medium-Induced Modifications of Jet Fragmentation in Pb - Pb Collisions at sNN =5.02 TeV Using Isolated Photon-Tagged Jets (Article) (Open Access)

Sirunyan, A.M.<sup>a</sup>, Tumasyan, A.<sup>a</sup>, Adam, W.<sup>b</sup>, Ambrogio, F.<sup>b</sup>, Asilar, E.<sup>b</sup>, Bergauer, T.<sup>b</sup>, Brandstetter, J.<sup>b</sup>, Brondolin, E.<sup>b</sup>, Dragicevic, M.<sup>b</sup>, Erö, J.<sup>b</sup>, Escalante Del Valle, A.<sup>b</sup>, Flechl, M.<sup>b</sup>, Friedl, M.<sup>b</sup>, Frühwirth, R.<sup>b,gu</sup>, Gheze, V.M.<sup>b</sup>, Grossmann, J.<sup>b</sup>, Hrubec, J.<sup>b</sup>, Jeitler, M.<sup>b,gu</sup>, König, A.<sup>b</sup>, Krammer, N.<sup>b</sup>, Krätschmer, I.<sup>b</sup>, ...

View additional authors

<sup>a</sup>Yerevan Physics Institute, Yerevan, Armenia  
<sup>b</sup>Institut für Hochenergiephysik, Wien, Austria  
<sup>c</sup>Institute for Nuclear Problems, Minsk, Belarus

View additional affiliations

Abstract

View references (54)

Measurements of fragmentation functions for jets associated with an isolated photon are presented for the first time in pp and Pb - Pb collisions. The analysis uses data collected with the CMS detector at the CERN LHC at a nucleon-nucleon center-of-mass energy of 5.02 TeV. Fragmentation functions are obtained for jets with  $p_{T,jet} > 30$  GeV/c in events containing an isolated photon with  $p_{T,\gamma} > 60$  GeV/c, using charged tracks with transverse momentum  $p_{T,trk} > 1$  GeV/c in a cone around the jet axis. The association with an isolated photon constrains the initial pT and azimuthal angle of the parton whose shower produced the jet. For central Pb - Pb collisions, modifications of the jet fragmentation functions are observed when compared to those measured in pp collisions, while no significant differences are found in the 50% most peripheral collisions. Jets in central Pb - Pb events show an excess (depletion) of low (high) pT particles, with a transition around 3 GeV/c. This measurement shows for the first time the in-medium shower modifications of partons (quark dominated) with well-defined initial kinematics. It constitutes a new well-controlled reference for testing theoretical models of the parton passage through the quark-gluon plasma. © 2018 CERN, for the CMS Collaboration. Published by the American Physical Society under the terms of the »https://creativecommons.org/licenses/by/4.0/« Creative Commons Attribution 4.0 International license. Further distribution of this work must maintain attribution to the author(s) and the published article's title, journal citation, and DOI. Funded by SCOAP3.

SciVal Topic Prominence

Topic: collisions | jets | jet quenching

Prominence percentile: 97.421

Indexed keywords

Engineering controlled terms:

Binary alloys

Engineering uncontrolled terms

Center-of-mass energies Fragmentation functions Isolated photons  
Jet fragmentation Measurements of Pb - Pb collisions Quark-gluon plasma  
Transverse momenta

Metrics

0 Citations in Scopus  
0 Field-Weighted Citation Impact



PlumX Metrics  
Usage, Captures, Mentions, Social Media and Citations beyond Scopus.

Cited by 0 documents

Inform me when this document is cited in Scopus:

Set citation alert >

Set citation feed >

Related documents

Study of jet quenching with isolated-photon+jet correlations in PbPb and pp collisions at sNN=5.02 TeV

Sirunyan, A.M. , Tumasyan, A. , Adam, W.  
(2018) *Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics*

Study of Jet Quenching with Z+jet Correlations in Pb-Pb and pp Collisions at s NN=5.02 TeV

Sirunyan, A.M. , Tumasyan, A. , Adam, W.  
(2017) *Physical Review Letters*

Studies of jet quenching using isolated-photon+jet correlations in PbPb and pp collisions at sNN=2.76TeV

Chatrchyan, S. , Khachatryan, V. , Sirunyan, A.M.  
(2013) *Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics*

ISSN: 00319007  
CODEN: PRLTA  
Source Type: Journal  
Original language: English


DOI: 10.1103/PhysRevLett.121.242301  
PubMed ID: 30608764  
Document Type: Article  
Publisher: American Physical Society


References (54)

View in search results format >

☐ All

Export

 Print

 E-mail

Save to PDF

Create bibliography

☐ 1

Karsch, F.

The phase transition to the quark gluon plasma: Recent results from lattice calculations

(1995) *Nuclear Physics, Section A*, 590 (1-2), pp. 367-381. Cited 65 times.  
doi: 10.1016/0375-9474(95)00248-Y

View at Publisher

☐ 2

Bjorken, J.D.

Highly relativistic nucleus-nucleus collisions: The central rapidity region

(1983) *Physical Review D*, 27 (1), pp. 140-151. Cited 2433 times.  
doi: 10.1103/PhysRevD.27.140

View at Publisher

☐ 3

Appel, D.A.

Jets as a probe of quark-gluon plasmas

(1986) *Physical Review D*, 33 (3), pp. 717-722. Cited 85 times.  
doi: 10.1103/PhysRevD.33.717

View at Publisher

☐ 4

Blaizot, J.P., McLerran, L.D.

Jets in expanding quark-gluon plasmas

(1986) *Physical Review D*, 34 (9), pp. 2739-2745. Cited 79 times.  
doi: 10.1103/PhysRevD.34.2739

View at Publisher

☐ 5

Gyulassy, M., Plümer, M.

Jet quenching in dense matter

(1990) *Physics Letters B*, 243 (4), pp. 432-438. Cited 521 times.  
doi: 10.1016/0370-2693(90)91409-5

View at Publisher